

DIN EN ISO 4029



ICS 21.060.10

Supersedes DIN 916,
December 1980 edition.

Hexagon socket set screws with cup point

(ISO 4029 : 2003)

English version of DIN EN ISO 4029

Gewindestifte mit Innensechskant und Ringschneide (ISO 4029 : 2003)

European Standard EN ISO 4029 : 2003 has the status of a DIN Standard.*A comma is used as the decimal marker.***National foreword**

This standard has been published in accordance with a decision taken by CEN/TC 185 'Threaded and non-threaded mechanical fasteners and accessories', to adopt, without alteration, International Standard ISO 4029 as a European Standard.

The responsible German body involved in its preparation was the *Normenausschuss Mechanische Verbindungselemente* (Fasteners Standards Committee), Technical Committee *Schrauben mit Innenantrieb*.

The DIN Standards corresponding to the International Standards referred to in clause 2 of the EN are as follows:

ISO Standard	DIN Standard
ISO 225	DIN EN 20225
ISO 261	DIN ISO 261
ISO 898-5	DIN EN ISO 898-5
ISO 965-2	DIN ISO 965-2
ISO 965-3	DIN ISO 965-3
ISO 3269	DIN EN ISO 3269
ISO 3506-3	DIN EN ISO 3506-3
ISO 4042	DIN EN ISO 4042
ISO 4759-1	DIN EN ISO 4759-1
ISO 6157-1	DIN EN 26157-1
ISO 8839	DIN EN 28839
ISO 10683	DIN EN ISO 10683
ISO 23429	DIN EN ISO 23429

Continued overleaf.

Document comprises 9 pages.

Amendments

DIN 916, December 1980 edition, has been superseded by the specifications of EN ISO 4029, which is identical to ISO 4029.

Previous editions

DIN 916: 1959-09, 1963-05, 1969-09, 1973-01, 1980-12.

National Annex NA

Standards referred to

(and not included in **Normative references** and **Annex ZA**)

DIN EN 20225	Bolts, screws, studs and nuts – Symbols and designations for dimensioning (ISO 225 : 1983)
DIN EN 26157-1	Fasteners – Surface discontinuities – Part 1: Bolts, screws and studs for general requirements (ISO 6157-1 : 1988)
DIN EN 28839	Mechanical properties of fasteners – Bolts, screws, studs and nuts made of non-ferrous metals (ISO 8839 : 1986)
DIN EN ISO 898-5	Mechanical properties of fasteners made of carbon steel and alloy steel – Part 5: Set screws and similar threaded fasteners not under tensile stresses (ISO 898-5 : 1998)
DIN EN ISO 3269	Fasteners – Acceptance inspection (ISO 3269 : 2000)
DIN EN ISO 3506-3	Mechanical properties of corrosion-resistant stainless steel fasteners – Part 3: Set screws and similar fasteners not under tensile stress (ISO 3506-3 : 1997)
DIN EN ISO 4042	Fasteners – Electroplated coatings (ISO 4042 : 1999)
DIN EN ISO 4759-1	Tolerances for fasteners – Part 1: Bolts, screws, studs and nuts – Product grades A, B and C (ISO 4759-1 : 2000)
DIN EN ISO 10683	Fasteners – Non-electrolytically applied zinc flake coatings (ISO 10683 : 2000)
DIN EN ISO 23429	Gauging of hexagon sockets (ISO 23429 : 2004)
DIN ISO 261	ISO general purpose metric screw threads – General plan (ISO 261 : 1998)
DIN ISO 965-2	ISO general purpose metric screw threads – Tolerances – Part 2: Limits of sizes for general purpose external and internal screw threads – Medium quality (ISO 965-2 : 1998)
DIN ISO 965-3	ISO general purpose metric screw threads – Tolerances – Part 3: Deviations for constructional screw threads (ISO 965-3 : 1998)

ICS 21.060.10

English version

Hexagon socket set screws with cup point
(ISO 4029 : 2003)

Vis sans tête à six pans creux, à bout
cuvette (ISO 4029 : 2003)

Gewindestifte mit Innensechskant und
Ringschneide (ISO 4029 : 2003)

This European Standard was approved by CEN on 2003-11-04.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, the Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland, and the United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Management Centre: rue de Stassart 36, B-1050 Brussels

Foreword

International Standard

ISO 4029 : 2003 Hexagon socket set screws with cup point, which was prepared by ISO/TC 2 'Fasteners' of the International Organization for Standardization, has been adopted by Technical Committee CEN/TC 185 'Threaded and non-threaded mechanical fasteners and accessories', the Secretariat of which is held by DIN, as a European Standard.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, and conflicting national standards withdrawn, by June 2004 at the latest.

In accordance with the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard:

Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, the Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland, and the United Kingdom.

Endorsement notice

The text of the International Standard ISO 4029 : 2003 was approved by CEN as a European Standard without any modification.

NOTE: Normative references to international publications are listed in Annex ZA (normative).

1 Scope

This International Standard specifies the characteristics of hexagon socket set screws with cup point and threads from M1,6 up to and including M24 and of product grade A.

If, in special cases, specifications other than those listed in this International Standard are required, they should be selected from existing International Standards, e.g. ISO 261, ISO 898-5, ISO 965-2, ISO 3506-3 and ISO 4759-1.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 225, *Fasteners — Bolts, screws, studs and nuts — Symbols and designations of dimensions*

ISO 261, *ISO general-purpose metric screw threads — General plan*

ISO 898-5, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 5: Set screws and similar threaded fasteners not under tensile stresses*

ISO 965-2, *ISO general purpose metric screw threads — Tolerances — Part 2: Limits of sizes for general purpose external and internal screw threads — Medium quality*

ISO 965-3, *ISO general purpose metric screw threads — Tolerances — Part 3: Deviations for constructional screw threads*

ISO 3269, *Fasteners — Acceptance inspection*

ISO 3506-3, *Mechanical properties of corrosion-resistant stainless-steel fasteners — Part 3: Set screws and similar fasteners not under tensile stress*

ISO 4042, *Fasteners — Electroplated coatings*

ISO 4759-1, *Tolerances for fasteners — Part 1: Bolts, screws, studs and nuts — Product grades A, B and C*

ISO 6157-1, *Fasteners — Surface discontinuities — Part 1: Bolts, screws and studs for general requirements*

ISO 8839, *Mechanical properties of fasteners — Bolts, screws, studs and nuts made of non-ferrous metals*

ISO 8992, *Fasteners — General requirements for bolts, screws, studs and nuts*

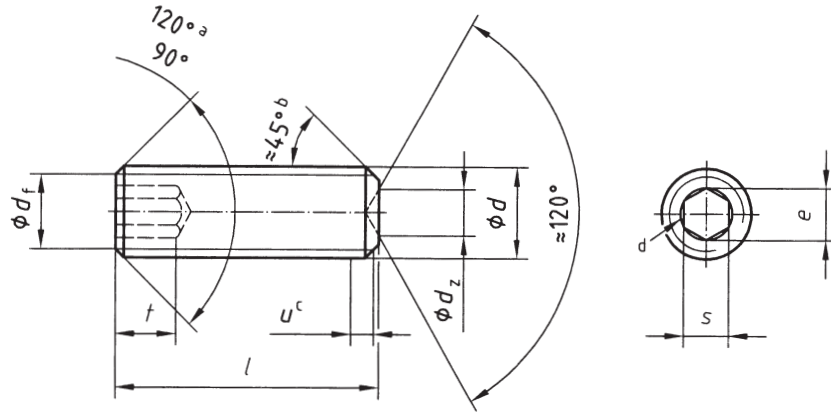
ISO 10683, *Fasteners — Non-electrolytically applied zinc flake coatings*

ISO 23429, *Gauging of hexagon sockets*

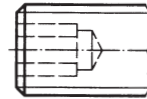
3 Dimensions

See Figure 1 and Table 1.

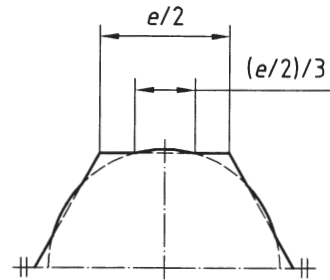
Symbols and designations of dimensions are specified in ISO 225.



Permissible alternative form of socket



For broached sockets which are at the maximum limit of size, the overcut resulting from drilling shall not exceed 1/3 of the length of any flat of the socket which is $e/2$.



- ^a The 120° angle is a requirement for short-length screws of nominal length, l , situated in the shaded areas in Table 1.
- ^b The 45° angle applies only to the portion of the point situated below the root diameter of the thread.
- ^c Incomplete thread $u < 2P$.
- ^d A slight rounding or countersink at the mouth of the socket is permissible.

Figure 1

Table 1 — Dimensions

Dimensions in millimetres

Thread (<i>d</i>)	M1,6	M2	M2,5	M3	M4	M5	M6	M8	M10	M12	M16	M20	M24		
<i>P</i> ^a	0,35	0,4	0,45	0,5	0,7	0,8	1	1,25	1,5	1,75	2	2,5	3		
<i>d_z</i>	max.	0,80	1,00	1,20	1,40	2,00	2,50	3,00	5,0	6,0	8,00	10,00	14,00	16,00	
	min.	0,55	0,75	0,95	1,15	1,75	2,25	2,75	4,7	5,7	7,64	9,64	13,57	15,57	
<i>d_f</i>	min.	≈ Minor thread diameter													
<i>e</i> ^{b, c}	min.	0,809	1,011	1,454	1,733	2,303	2,873	3,443	4,583	5,723	6,863	9,149	11,429	13,716	
<i>s</i> ^c	nom.	0,7	0,9	1,3	1,5	2	2,5	3	4	5	6	8	10	12	
	max.	0,724	0,913	1,300	1,58	2,08	2,58	3,08	4,095	5,14	6,14	8,175	10,175	12,212	
	min.	0,710	0,887	1,275	1,52	2,02	2,52	3,02	4,020	5,02	6,02	8,025	10,025	12,032	
<i>t</i>	min. ^d	0,7	0,8	1,2	1,2	1,5	2	2	3	4	4,8	6,4	8	10	
	min. ^e	1,5	1,7	2	2	2,5	3	3,5	5	6	8	10	12	15	
<i>l</i>			Approximate mass, in kilograms per 1 000 pieces ($\rho = 7,85 \text{ kg/dm}^3$) (for information only)												
nom.	min.	max.													
2	1,8	2,2	0,019	0,029											
2,5	2,3	2,7	0,025	0,037	0,063										
3	2,8	3,2	0,029	0,044	0,075	0,1									
4	3,76	4,24	0,037	0,059	0,1	0,14	0,23								
5	4,76	5,24	0,046	0,074	0,125	0,18	0,305	0,42							
6	5,76	6,24	0,054	0,089	0,15	0,22	0,38	0,54	0,74						
8	7,71	8,29	0,07	0,119	0,199	0,3	0,53	0,78	1,09	1,88					
10	9,71	10,29		0,148	0,249	0,38	0,68	1,02	1,44	2,51	3,72				
12	11,65	12,35			0,299	0,46	0,83	1,26	1,79	3,14	4,73	6,7			
16	15,65	16,35				0,62	1,13	1,74	2,49	4,4	6,73	9,5	15,7		
20	19,58	20,42					1,4	2,22	3,19	5,66	8,72	12,3	20,9	31,1	
25	24,58	25,42						2,82	4,07	7,24	11,2	15,8	27,4	41,4	55,2
30	29,58	30,42							4,94	8,81	13,7	19,3	33,9	51,7	70,3
35	34,5	35,5								10,4	16,2	22,7	40,4	62	85,3
40	39,5	40,5								12	18,7	26,2	46,9	72,3	100
45	44,5	45,5									21,2	29,7	53,3	82,6	115
50	49,5	50,5									23,6	33,2	59,8	92,6	130
55	54,4	55,6										36,6	66,3	103	145
60	59,4	60,6										40,1	72,8	114	160

NOTE Commercial lengths are those between the bold stepped lines.

^a *P* is the pitch of the thread.

^b $e_{\min} = 1,14 s_{\min}$.

^c Combined gauging of socket dimensions *e* and *s*, see ISO 23429.

^d For screws with nominal lengths in the shaded areas.

^e For screws with nominal lengths below the shaded areas.

4 Requirements and reference International Standards

See Table 2.

Table 2 — Specifications and reference International Standards

Material		Steel	Stainless steel	Non-ferrous metal
General requirements	International Standard	ISO 8992		
	Tolerance	6g		
Thread	International Standards	ISO 261, ISO 965-2, ISO 965-3		
	Property class	45H	A1-12H, A2-21H, A3-21H, A4-21H, A5-21H	As agreed
Mechanical properties	International Standards	ISO 898-5	ISO 3506-3	ISO 8839
	Product grade	A		
Tolerances	International Standard	ISO 4759-1		
	Finish	As processed	Plain	Plain
Requirements for electroplating are covered in ISO 4042. Requirements for non-electrolytically applied zinc flake coatings are covered in ISO 10683.				Requirements for electroplating are covered in ISO 4042.
Surface discontinuities	Limits for surface discontinuities are covered in ISO 6157-1.	—	—	—
	Acceptability	For acceptance procedure, see ISO 3269.		

5 Designation

EXAMPLE A hexagon socket set screw with cup point, thread M6, nominal length $l = 12$ mm and of property class 45H, is designated as follows:

Hexagon socket set screw ISO 4029 - M6×12 - 45H

Annex ZA (normative)

Normative references to international publications with their relevant European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE Where an International Publication has been modified by common modifications, indicated by (mod.), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN</u>	<u>Year</u>
ISO 225	1983	Fasteners - Bolts, screws, studs and nuts - Symbols and designations of dimensions	EN 20225	1991
ISO 898-5	1998	Mechanical properties of fasteners made of carbon steel and alloy steel - Part 5: Set screws and similar threaded fasteners not under tensile stresses	EN ISO 898-5	1998
ISO 3269	2000	Fasteners - Acceptance inspection	EN ISO 3269	2000
ISO 3506-3	1997	Mechanical properties of corrosion-resistant stainless-steel fasteners - Part 3: Set screws and similar fasteners not under tensile stress	EN ISO 3506-3	1997
ISO 4042	1999	Fasteners - Electroplated coatings	EN ISO 4042	1999
ISO 4759-1	2000	Tolerances for fasteners - Part 1: Bolts, screws, studs and nuts - Product grades A, B and C	EN ISO 4759-1	2000
ISO 6157-1	1988	Fasteners - Surface discontinuities - Part 1: Bolts, screws and studs for general requirements	EN 26157-1	1991
ISO 8839	1986	Mechanical properties of fasteners - Bolts, screws, studs and nuts made of non-ferrous metals	EN 28839	1991
ISO 10683	2000	Fasteners - Non-electrolytically applied zinc flake coatings	EN ISO 10683	2000